SYSTEM AND METHOD FOR GENERATING AND PRESENTING MULTI-MODAL APPLICATIONS FROM INTENT-BASED MARKUP SCRIPTS

ABSTRACT OF THE DISCLOSURE

Systems and methods for rendering modality-independent scripts (e.g., intent-based markup scripts) in a multi-modal environment and, in particular, to a multi-modal user interface for an application, whereby the user can interact with the application using a plurality of modalities (e.g., speech and GUI). Preferably, the multi-modal interface automatically synchronizes I/O events over the plurality of modalities presented. In a preferred embodiment, the multi-modal application user interface affords a user a choice of speech and/or graphical user interface modalities, in which modality-specific details of presentation are automatically determined by the system through the use of built-in rules and optional user-supplied preferences, and need not be included in the dialog specification. In one aspect, the system provides immediate rendering of the modality-independent document in each of the supported modalities. In another aspect, the system provides deferred rendering and presentation of intent-based scripts to an end user, wherein the system comprises a transcoder for generating a speech markup language script (such as a VoiceXML document) from the modality-independent script and rendered (via, e.g., VoiceXML browser) at a later time. Both immediate and deferred renderings may be performed in either speech-only or multi-modal fashion. In other aspects of the present invention, mechanisms are provided for automatic generation of application-specific "help" information in the form of a description of the hierarchy and navigational flow of the application, analyzing the manner in which navigation through the modality-independent script may be performed, scripted emulation of

point-and-click navigation applied to the speech interface, automatic insertion of program calls into the voice script invoking functions that will synchronize events occuring at the field level between the speech/aural interface and the GUI interface, and automatic insertion of program calls into the voice script invoking user supplied functions to perform variable initialization and other application-specific tasks. In another aspect, the present invention comprises a mechanism for enabling flexible user navigation, help, contextual help, and feedback suitable to each presentation modality during the dialog interaction. The method of user navigation comprises both hierarchical and nonhierarchical traversal options. The system synchronizes the states of each presentation modality during the dialog interaction.